

Space News Roundup

Vol. 30

May 31, 1991

No. 22

STS-40 countdown resumes for Saturday launch

By James Hartsfield

The Space Shuttle *Columbia*, with last week's troubles behind it, began sailing through a smooth countdown late Tuesday toward a liftoff at 7 a.m. CDT Saturday on STS-40, the first shuttle mission solely dedicated to medical operations.

NASA managers halted the launch last week after almost simultaneous problems cropped up with: an aft multiplexer-demultiplexer (MDM), one of 28 such relays for computer commands to various systems onboard; a general pur-

pose computer, one of the spacecraft's five onboard flight control computers; and temperature sensors in the main engine fuel lines.

"A lot of excellent hard work by many people has gone into fixing the problems during the last week, and thanks to them, we're confident in the vehicle," said Mike Conley, *Columbia's* spacecraft manager. "We're ready to fly."



**STS-40
COLUMBIA**

The aft MDM, designated MDM FA2, was replaced with a new unit that was retested during the weekend and has performed flawlessly.

Also, the GPC, designated GPC 4, was replaced with a new computer that has since functioned normally.

Columbia's nine fuel line temperature sensors, in question due to a failure analysis of one such sensor removed from the spacecraft last fall,

were removed and replaced with six spare sensors, five for oxygen and one for hydrogen. The inlets for three more hydrogen sensors were plugged, leaving the only sensor in the hydrogen system above a screen in the lines that would catch any debris prior to its entering the main engines. In addition, one model of the hydrogen sensors that was determined to have a tendency to have cracks form around the welds on its tip was taken out of service and will no longer be used in the shuttle fleet.

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Columbia points skyward from atop the mobile launcher platform at KSC's launch pad 39B.



JSC Photo by Mark Sowa

Local dignitaries, Texas politicians and NASA officials participate in the ground breaking ceremony for Space Center Houston, JSC's new visitors center that is slated to open in the fall of 1992.

Ribbon cutting set for new gym

By Kelly Humphries

The squeak of basketball shoes already is being heard inside the Gilruth Center's new hardwood-floor gymnasium, but JSC managers will officially open the gym at a 4 p.m. ribbon-cutting ceremony today.

The ceremony will be held in the new foyer that links the older Gilruth building with the new 175-by-105-foot gym, said Teresa Sullivan, JSC's NASA Exchange Operations manager. The gym unofficially opened May 22. It is

designed primarily for basketball and volleyball, but also will be used for other activities.

The new foyer will provide closer control of those entering the gym, said Christine Jowid, recreation director. A Gilruth Center employee will electronically control the doors leading to the weight room and the older building, and JSC employees will be required to present their NASA, contractor or Employee Activities Association badges.

The new gym will allow basketball and volleyball leagues to double in

size and provide options such as men's and women's leagues for volleyball, which now has only mixed leagues. The expanded basketball schedule will include three men's C leagues, one men's B league, one men's A league, and one mixed league.

Basketball and volleyball leagues will alternate weeks in the new gym and the old gym next season. League fees will be increased by \$25 on all sports, and the weight safety class required for use of the weight room will increase to \$5.

Space Center Houston: ground broken, lift off

By Pam Alloway

The sky is not the limit for NASA, and projects like the Space Center Houston and Space Station *Freedom* are important parts of that limitless future, officials and politicians told about 1,200 people Tuesday at the ground breaking ceremony for Space Center Houston, JSC's new \$70 million visitors center.

"Space Center Houston is going to touch right to the core of one of the most important responsibilities that NASA has," said Adm. Richard Truly, NASA administrator. "It's laid out in the 1958 Space Act. It is the responsibility to tell the public, to tell the people of America, to tell the people from other lands that come through here about the advantages of the space program not just out in space but here at home on Earth."

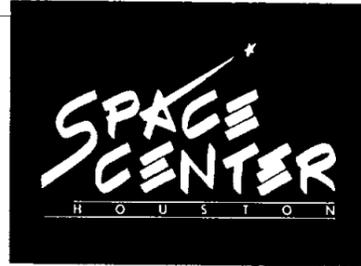
Speaking about the future, Truly emphasized that no mission was more important than the construction of another facility — the Space Station *Freedom*.

"This important program for the future, as you know from the newspapers, is under fiscal attack, but I can assure you in the end it will be built," he said. "It will be constructed and visitors to Space Center Houston will read about it and see it as they visit here throughout the 1990s."

Enthusiasm soared with the morning's temperature as a large countdown clock ticked away the minutes until the ground breaking. The Space Center Houston Orchestra and the

Singing Texans of the First Baptist Church of Houston set the tone with a medley of patriotic songs before the speakers began greeting the crowd.

"This is a proud and happy day for me as director of Johnson Space Center," said JSC Director Aaron Cohen. "The United States' manned space program and the work of this center belong to the American people and it is important that they be able to learn about it and experience it first hand. The facility we begin to construct today will provide that access."



The Disney-designed visitors center will be located near JSC's main entrance. The 183,000-square-foot facility is expected to add about \$100 million to the Houston-area

economy and attract 2.3 million visitors its first year. The grand opening for the 50-acre center is scheduled for the fall of 1992. Vance Ablott is the center's general manager.

The center will offer tourists hands-on attractions, such as computer-simulated shuttle flights, simulations of weightlessness and moon rock displays. It also will feature two theaters, one with a screen more than five stories tall, that will tell the story of astronaut training.

Once opened, visitors will receive a personally guided tram tour of JSC and special programs will be held in the lobby of Space Center Plaza. Restaurants and gift shops also will be available in the visitors center.

Please see **JSC**, Page 4

JSC awards maintenance and operations contract

JSC has selected Johnson Controls World Services, Inc. of Cape Canaveral, Fla., for final negotiations on the JSC plant maintenance and operation support requirements.

The total proposed cost and fee of the five-year effort that will begin Nov. 1 is about \$96 million. The five year performance period will be divided into a one-year base contract period and four one-year contract option periods. The award will be a continuation of the maintenance and operations support currently being performed by Johnson Controls. The previous contract also covered a five-year time period and had been awarded to Pan American World Services, Inc. Recently Johnson Controls purchased Pan American World Services, Inc.

The contracted work will be performed at facilities throughout JSC and at NASA-owned facilities at Ellington Field. There are about 300 people who will work under this contract.

The work covered under the contract includes the continuous operation and maintenance of all JSC utility systems, potable water systems, electrical power systems, waste disposal systems, and maintenance of building structures, roads, parking lots and a variety of special equipment.

Also submitting proposals for the maintenance and operations requirements were: FD Services Inc. of Greenville, S.C.; Jacobs Engineering of Houston; and H.B. Zachry Company of Deer Park, Texas.



JSC Photo by Bill Blunk

Engineering Director Henry Pohl and JSC Director Aaron Cohen tour the Aeroassist Flight Experiment structural test article in Bldg. 10. The test article, manufactured at JSC, shows the handiwork of the Engineering Directorate and the Technical Services Division. Also pictured are (left to right): Don Wade, Structures and Mechanics Division chief; Joe Lee and Mike Adkins of Technical Services.

Britain's queen enjoyed visit

The message might have gone through a couple of people before it arrived in Houston, but the intent was clear and direct — Queen Elizabeth II enjoyed her visit to JSC.

In fact, the queen called President George Bush last week to thank him for the wonderful visit at JSC. Bush then called Admiral Richard Truly who called JSC Director Aaron Cohen to relay the message. The queen and Prince Philip, Duke of Edinburgh visited JSC May 22.

"NASA and JSC accepted this as a great honor for the President to take time to call and relay this message to us," Cohen said. "I'm very pleased, and both Admiral Truly and I wanted the people who were involved in the visit to know this and express our appreciation for all their hard work and the gracious reception they provided."

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays.

General Cinema (valid for one year): \$4.
AMC Theater (valid until May 1992): \$3.75.
Loews Theater (valid for one year): \$4.
Astroworld (valid 1991 season): season, \$44.94; child less than 4-feet, \$10.12; one day, \$15.85; Waterworld, \$8.15.
Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adults, \$17.25.
Six Flags (valid until Nov. 17, 1991): one-day, 15.95; child less than 4-feet, 14.95; two-day, 20.95.

JSC

Gilruth Center News

Defensive driving—Course is offered from 8 a.m.-5 p.m., July 13, Aug. 10 or Sept. 21. Cost is \$15.

Aerobic dance—Eight-week session meets 5:15-6:15 p.m. Tuesday and Thursday nights. Cost is \$24.

Exercise class—Class meets 5:15-6:15 p.m. Monday and Wednesday nights. Cost is \$24.

Weight safety—Required course for employees wishing to use the Gilruth weight room. The next classes will be from 8-9:30 p.m. June 5 and June 20. Cost is \$5.

Ballroom dance—Beginning and intermediate ballroom dancing lessons will be offered for eight weeks. Cost is \$60 per couple.

Country and western dance—Six weeks of Monday night sessions begin June 17. Cost is \$20 per couple.

Tennis—Six-week beginning class meets Mondays starting June 3. Intermediate class starts June 5. Cost is \$32.

AIKIDO—Martial arts class meets Tuesdays for six weeks beginning June 26. Cost is \$30 per person.

Fiction Workshop—A six-week workshop will begin June 26. Cost is \$80 per person.

JSC

Technical Library News

The following selections are now available in JSC's Technical Library, Bldg. 45, Rm. 100.

Principles, Policies and Procedures: Domestic Geographic Names. Donald J. Orth; 1987. G105.077.987.

Chemical Safety Data Guide. Bureau of National Affairs; 1985. KF1875.C493.1985.

Hazardous Waste Management: Regulatory Compliance and Liability Management. American Institute of Hazardous Materials Management; 1988. KF3958.H39.1988.

What Black Educators Are Saying. Hawthorn Books; 1970. LC2801.W95.1970.

All Hands on UNIX Video Workshop. Concurrent Computer Corp., 1989. QA76.063.A44.1989.

JSC

Swap Shop

Property

Sale: Bolivar, 4 Crystal Beach lots, ea 50'x100', sell one or more, reasonable. 921-7212.

Sale: House and bldg in Heights: vacant lot in Pearlland; warehouse w/offices, fenced. Erwin, 485-9796.

Sale: Countryside So house on cul de sac, new carpet, paint, wall paper, landscaped, near pool, tennis, school, \$73K FHA assum 10%. David, x35464.

Sale: Deer Park, white brick, 3-2-2, lg rooms, curtains, clean, \$62.9K. Ann, 487-4488.

Sale: Westwood Shores lot on Lake Livingston, appraisal value \$9.5K, sell \$6K OBO. x30032 or x18134.

Rent/Sale: Piper's Meadow, 3-2-2, \$850/mo or \$90K assum. 486-0610.

Sale: Hangar, 2025 sq ft, 12' high bilfold doors, 409 sq ft apt on top, Houston SW airport, all elec and plumbing, lot is 55' x 115', building and land. \$80K. 487-4705.

Sale: Galveston bay waterfront home, 3-3, 6-car gar, deck, spa, extras. 334-1909.

Sale: Hilltop Lakes cabin lot in Leon County, private airstrip, bass fishing, golf course, tennis, \$6.5K OBO. 333-5177.

Sale: Santa Fe, custom all brick 3-2-2, fenced on 1 restricted acre, energy-saving features, oak cabinets, FPL, \$124.5K. (409) 925-8760.

Lease: Webster/Ellington, 2-1, W/D, \$460/mo. Dave, x38156 or Eric, x38420.

Sale: Toledo Band, seven lots, 2 waterfront, heavily wooded. 334-1909.

Rent: Condo, 2-2, indoor W/D conn, FPL, res parking, nonsmoker, no pets, refrig, avail June 1, \$510/mo. x38889 or 480-1340.

Sale: Bayou Vista lot on west bay, good bulkhead, \$5.9K. 339-1957.

Sale: League City, 3-1.5-1, mini blinds, ceiling fan, fence, deck, ceramic floor, FPL, assume w/no approval, \$59.5K. 554-7727.

Lease: League City, 4-2-2. 2000 sq ft, FPL, fans, lg fenced yard, deck, near schools. Richard, x31440 or 332-2381.

Sale: Nassau Bay Queen's Court townhome, 3-2-2A, 2-story, unique floorplan, new roof, wet bar, den, FPL, 3 sky-lights. Vince, 282-3497 or 333-5598.

Lease: Nassau Bay, 4-2-2, park, no pets, 2 living areas, newly reded, deck, 1.5 story, 2000 sq ft, \$690/mo. 333-6806 or 484-4944.

Lease: Rent Ellington Field, 3-2-2, energy efficient, gas appt, indoor laundry, \$775/mo. 332-9719.

Cars & Trucks

'89 Pontiac Sunbird SE, auto, P/S, P/B, tilt wheel, stereo, alum wheels, fold down rear seats, delay wipeers, sports hitch, ext warr, dark tint wdws, undercoated, good gas mi, 25K mi, \$7350. 326-1303.

'79 Pinto, tan, std, a/c, new tires, 70K mi; '82 Ford Bronco, full sz, new eng/trans, 90K mi on body, 3.5K mi on eng, \$3K OBO. 568-4099 or 996-9646.

'90 Sunbird SE, sunroof, tilt, AM/FM/cass, ex cond, \$9400 OBO. (409) 925-1802.

'81 Camaro, good tires, BO, Steve, x35923.

'84 Nissan 300ZX, 2+2, auto, A/C, stereo, \$5650; '80 Pontiac Phoenix V6, auto, A/C, stereo, \$1950, sell one not both. x30092 or 481-3637.

'88 Chevy Beretta, 34K mi, 251 option, 2.8 liter V6, 5 spd trans, P/S, P/B, A/C, stereo/cass/AM/FM, \$6750 OBO. 488-1706.

'87 Chevy Iroc-Z Camaro, fully loaded, T-Top, ex cond, low mi, auto, new tires, \$8900. 585-8932.

'85 Mitsubishi PU, 80K mi, A/C, AM/FM/cass, 1/2 ton, new tires, battery, timing belt, clutch, \$2250. Marcus x34046.

'83 Chev Monte Carlo, V-8, auto, low mil, runs good, \$2.2K. 998-0407.

'84 Nissan 300ZX, 2+2, 5 spd, silver blue, 66K, A/C, T-tops, P/W, AM/FM/cass. x37546 or 480-1937.

'78 Camaro, looks and runs good, \$1395 OBO. 333-6671 or 332-9105.

'85 Ford LTD Crown Victoria station wagon, 5.0L V-8, auto, P/S, P/B, A/C, P/W, P/L, cruise, tilt, stereo, \$3499 OBO. Jeff, 282-7744 or 996-1907.

'82 Chevy Suburban, Silverado, dual A/C, new trans, trf pkg, 80K mi, \$3850, x30186.

'83 Porsche 944, red w/beige int, 5 spd, A/C, sun roof, 71K mi, \$8.5 K. x39235 or 474-3424.

'85 Pontiac Grand Am, 3.0 eng, good tires, ex cond.

334-1909.

'77Chevy Scottsdale trk, A/C, P/S, P/B, AM/FM/cass stereo, blue w/roll bar, good running cond \$2.4K OBO. John, x33092 or 488-2756.

'79 Nissan 280Z, 5 spd, 174K mi, A/C, AM/FM/cass, good cond, \$2750. 334-1867.

'90 Subaru Legacy/L5, 4 dr, black w/lt int, 4-wheel disk brakes, elec sun roof, P/W, P/S, P/B, PDL, all extras, 38K mi, \$12K OBO. Bob, 480-1225 or 474-4747.

'79 Ford Granada, gold, 70K mi, good tires, fair body, \$700 OBO. Diana, 282-4101 or 992-2443.

'67 Chevy Caprice, 4 dr hard top, P/S, P/B. 396 4tbl, runs good, needs body work, \$1.5K OBO. Michael, x36719 or (409)948-2624.

'89 Ford Probe GT Turbo, ex cond, many extras, \$10.895. Dan, 280-2780 or 457-2850.

'86 Toyota 4 Runner 4x4, ex cond, 4 cly, F15-spd OD, 73K mi, 7.5K OBO. Bob, 996-0393.

'87 Toyota MR 2, 33K mi, white, 5 spd, sunroof, spoiler, ex cond, \$10.5K OBO. Mike, 283-5679 or 332-1617.

'90 Jimmy, white w/blu int, low mi, loaded, ex cond, \$12.3K; '87 Ford Ranger PU ext cab, silver, \$5.7K. 482-0250.

'85 Jeep CJ-7, red, black hard top and bikini top, 6 cyl, 5 spd, A/C, P/S, AM/FM/cass, 59K mi, \$6.5K. 470-0777.

'79 Toyota, 4WD PU, auto, eng/trans/mech, \$1.5K. Bob, x34409 or 393-1670.

'88 Mitsubishi Precis, 3 dr, 5 spd, A/C, AM/FM/cass, cloth int, good cond, \$3.5K. 333-7070 or 482-2342.

'83 Olds, Delta Royale, Brougham, ex cond, V8, 2 dr, all pwr, AM/FM/cass, cruise, 96K mi, \$2.8K. 980-6169.

'80 Toyota Celica ST, ex cond, sun roof, \$1650. 486-1888.

'86 Dodge D-150 PU, 318 V-8, P/S/P/B, A/C, camper shell, AM/FM/cass, auto, low mi, \$5.8K. Matt, x34285 or 486-7260.

Jeep CJ-7 Bikini top, black, ex cond, \$50. 644-2616.

'85 Chevy Silverado PU, auto, P/W, P/L, dual tanks, toolbox, headrack, whitetank, \$4K. x31495 or 337-4305.

'84 Olds Ciera, new re-built eng, ex cond, 4 dr, 4 cly, lt blue, A/C, auto, \$2.7K, 280-2192 or 480-6697.

'80 Fiat Spider convert, 61K mi, white w/blu int, new paint and tires, ex cond, \$3K. Mark, 474-2195

Cycles

Honda 650 turbo, low mi, new tires/batt. 334-1909.

'79 Yamaha XS1100, shaft, dr, disk brakes front/rear, 16K mi, ex cond, \$950 OBO. Wally, x36440 or 326-2664.

'86 Suzuki Cavalcade LXE, touring bike, approx 7K mi, AM/FM/cass/intcom, cruise, A/C, adjust seats, \$7K. 534-4742.

'83 Honda Goldwing police bike w/saddle bags, windshield, 90K mi, well maint, \$2K. Brad, 282-3570.

'84 Kawasaki GPZ 750, 8.5K mi, \$2K. OBO. Shannon, x32646 or 484-5412.

Unicycle 24", \$30. John, x38890 or 488-0559.

Boats & Planes

O'Brien Freesail sailboard, 12', 45lbs, 5.4 sail, stable, adjust centerbd, sail battens, gear bag, \$175. x32539 or 538-1649.

Evinrude, 25 hp, elec start, new, \$1.4K. Jerry Craig, 283-5311 or 420-2936.

Boat slip on Clear Lake w/roof and motorized boat hoist for power boats, great access to the water, \$125/mo. 474-9220.

'70 Coronado 25, new mainsail w/cover, 2 jibs, depth sounder, compass, 7.5 hp out w/controls, good cond, \$5.5K. John, x30217 or 484-0395.

'52 Beachcraft bonanza, full IFR, fresh prop and annual, based at Clover field, spare eng incl, 1/4 share, \$5K. x38740 or 992-3827.

'81 Steekcraft jet boat, 21', 425 Olds (375 stock hp) w/Berkley jet dr, \$2K OBO. Bob, 996-0393.

Sunfish sailboat and trlr, fair cond, good sails, wooden motor boat and trlr, no motor, good cond, \$200 for both OBO. x33335 or 326-2582.

'83 Renken 18' sailboat, roller furling jib, 4 hp aux, galv trlr, sleeps 4, good cond, \$4K. 339-3476.

Audiovisual & Computers

Smith Corona home word processor, \$400 OBO. Diane, 283-5618.

Realistic mini cass recorder/player w/110v power supply, \$15; Realistic stereo tape control center, records/moni-

Today

Cafeteria menu—Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: buttered corn, green beans, new potatoes.

Saturday

LDEF symposium—NASA will sponsor the first Long Duration Exposure Facility post-retrieval symposium June 2-8 at the Hyatt Orlando Hotel in Kissimmee, Fla. This is the first of three planned symposiums involving the dissemination of LDEF data with team members and the international community. For more information contact Arlene Levine, (804) 864-3782.

Monday

Blood screening—The JSC Clinic will offer total blood cholesterol counts and blood pressure screenings the week of June 3-7 at various locations around the center. For more information or times contact the clinic, x34111.

Cafeteria menu—Special: chili and macaroni. Entrees: barbecue sliced beef, parmesan steak, spare rib with kraut. Soup: French onion. Vegetables: ranch beans, English peas, mustard greens.

Tuesday

Inventor's luncheon—The JSC Inventor's Luncheon will be at noon June 4 at the Gilruth Center, Rm. 216. The luncheon honors JSC employees whose NASA patents were issued in 1990. For more information contact the JSC Office of Patent Counsel, x31012.

Cafeteria menu—Special: corned beef hash. Entrees: meatballs and

spaghetti, liver and onions, baked ham with sauce. Soup: split pea. Vegetables: buttered cabbage, cream style corn, whipped potatoes.

Wednesday

Astronomy seminar—The JSC Astronomy Seminar will be held at noon June 5 in Bldg. 31, Rm. 129. This will be an open discussion meeting. For more information contact Al Jackson, 333-7679.

Cafeteria menu—Special: barbecue link. Entrees: cheese enchiladas, roast pot and dressing. Soup: seafood gumbo. Vegetables: pinto beans, Spanish rice, turnip greens.

Thursday

NCMA seminar—The National Contract Management Association will host a course on "Accounting for Government Contracts" at 3:30 p.m. June 6 at the Nassau Bay Hilton. Cost is \$35. For more information call 622-7733.

Cafeteria menu—Special: chicken fried steak. Entrees: roast beef with dressing, fried perch, chopped sirloin. Soup: beef and barley. Vegetables: whipped potatoes, peas and carrots, buttered squash.

June 7

Cafeteria menu—Special fried chicken. Entrees: fried shrimp, baked fish, beef stroganoff. Soup: seafood gumbo. Vegetables: okra and tomatoes, buttered broccoli, carrots in cream sauce.

June 10

AIAA lunch and learn—A lunch and learn meeting of the American Institute of Aeronautics and Astronautics' international space

activities committee will be at 11:30 a.m. June 10 in Bldg. 3. Dr. Hideo Hasegawa, director of the NASDA Liaison Office, will speak on NASDA Space Operations in Japan and America.

June 12

Astronomy seminar—The JSC Astronomy Seminar will be held at noon June 12 in Bldg. 31, Rm. 129. Dr. Norm Ness, Bartol Institute, will speak on Planetary Magnetism. For more information contact Al Jackson, 333-7679.

June 19

Astronomy seminar—The JSC Astronomy Seminar will be at noon June 19 in Bldg. 31, Rm. 129. Dr. Rudolph Decker will speak on "Testing General Relativity in Space." For more information contact Al Jackson, 333-7679.

June 21

Juneteenth celebration—The Black Programs Committee of JSC's Equal Opportunities Program will commemorate Juneteenth in the form of a traditional picnic at 4:30 p.m. June 21 at the Gilruth Center. Tickets are available from Pat Burke in the Equal Opportunity Programs Office in Bldg. 1, Rm. 172. Cost is \$6 adults; \$3 children (8 and younger). For more information contact Freda Marks, x30603.

June 25

BAPCO meets—The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m. June 25 at the League City Bank and Trust. For more information contact Earl Rubenstein, x34807 or Tom Kelly, 996-5019.

tors up to 3 decks, \$10. Ronnie, x32539 or 538-1649.

Commodore 1280 w/built in 1571 disk drive, 1526 printer, Roland DG color monitor, modem, manuals, SW, warr, \$450. John, x38429 or 482-6536.

Apple II+ w/80-col card, green mono monitor, 5-1/4", Olivetti pr 2300 Ink-Jet, lle w/green mono monitor, 5-1/4", assorted SW, \$600 OBO. Brantley, 331-0361

IBM XT computer, ex cond, 640K RAM, 30 MB HD, 2 FD, color monitor, \$975. x36290.

Disk drive 800K (internally) for MAC II. ex cond. \$150. Suni, 283-4329 or 480-4270.

AT-286 mini desk top PC system, 2 MB RAM, 1.2 MB FD, 42 MB HD, 2 ser/2 par built in clock, color VGA monitor, \$975; Robotics 2400 modem, \$225; compl hand scanner, \$125; 10MB HD, \$75; mouse, \$25. 282-3261.

SW, educational, word scramble, play and learn, age 7-11, for IBM clones, full pkg w/manual, \$25. Youm, 283-4813.

Advent II mini speakers, ex cond, \$100; Lotus 1-2-3 vers 3.1, boxed, \$300 OBO. Rod x32300 or 286-8257.

Macintosh+, multi tasking, 4M RAM +800K FD, SW, ex cond, \$650. 283-5471 or 280-8796.

Apple II GS, 3.5 and 5.25 drives, color monitor, mouse, joystick, SW. Craig or Kit, 992-4914.

Apple II+, two disk drives, monitor, SW, \$300. Brad, 282-3570.

XT Clone computer, 20 MB HD, dual 360K FD, multi-function card, color-RGB/CGA, printer, \$700. Bob, x34409 or 393-1670.

Amiga music SW, Midi interface, word processor, terminal program, some games, Joe, 996-1667.

SW, On-Time (scheduler) new, \$25; 286 Ada w/updates, \$125; Moonbase new, \$40; Lotus 1-2-3 v2.1 (student edition), \$50; 286 PC w/80 MB HD, 1.44 and 1.2 FD, color VGA (.31 dot) monitor; 8 MB RAM (opt). 339-1337.

IBM compatible 286 AT, 32 MB HD, 1 MB RAM, 1.2 MB and 360K 5.25 FD's, 2 ser ports, 3 para ports, 101 keyboard, 13" CGA color monitor, Epson FX85 printer, ex cond, \$950 OBO. 482-8998.

Cerwin-Vega HED-15 high efficiency speakers, 100w, \$250 OBO. Steve, 282-4108 or 333-3176.

Toshiba BD-7815 copier w/cab/stand, zoom, paper up to 11x17, energy saver feature, needs adjust, \$1K OBO. Bob, 480-1225 or 474-4747.

Musical Instruments

Violin 3/4 sz, w/new bow, in case, \$300 OBO. Bebe, x35136 or 480-2496.

Gibson Thunderbird bass w/case, ex cond, \$60; '81 Moog minimoog synthesizer, ex cond, classic analogue sound, \$500. Gary, x32144.

Ventura elec guitar w/Gibson amp, \$150 OBO. Doug, 333-6424.

Pets & Livestock

Cockatiels, hand-fed, Linda, 484-7834.

Toy Dachshund, papers, 3 yrs, was \$350, now \$125. Bebe, x35136 or 480-2496.

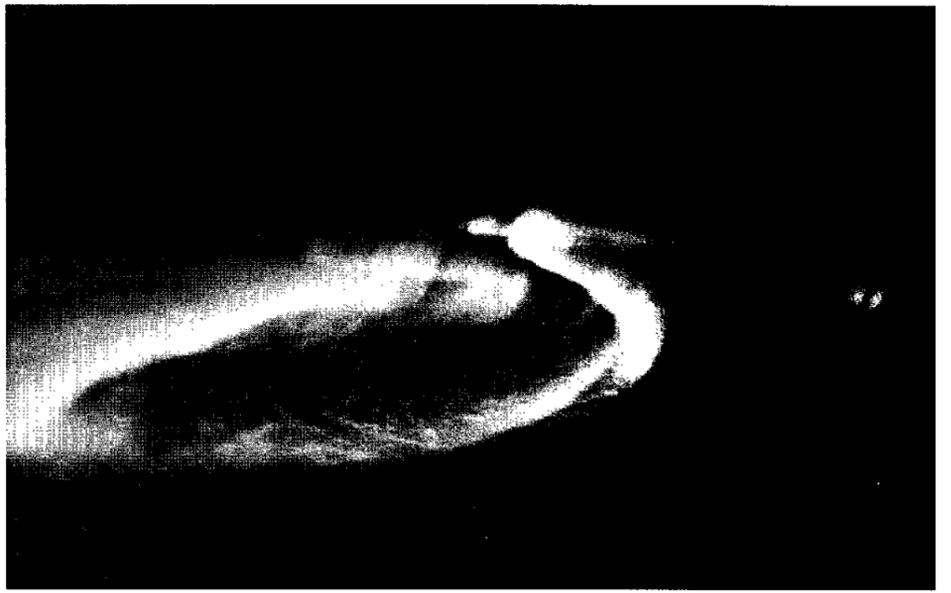
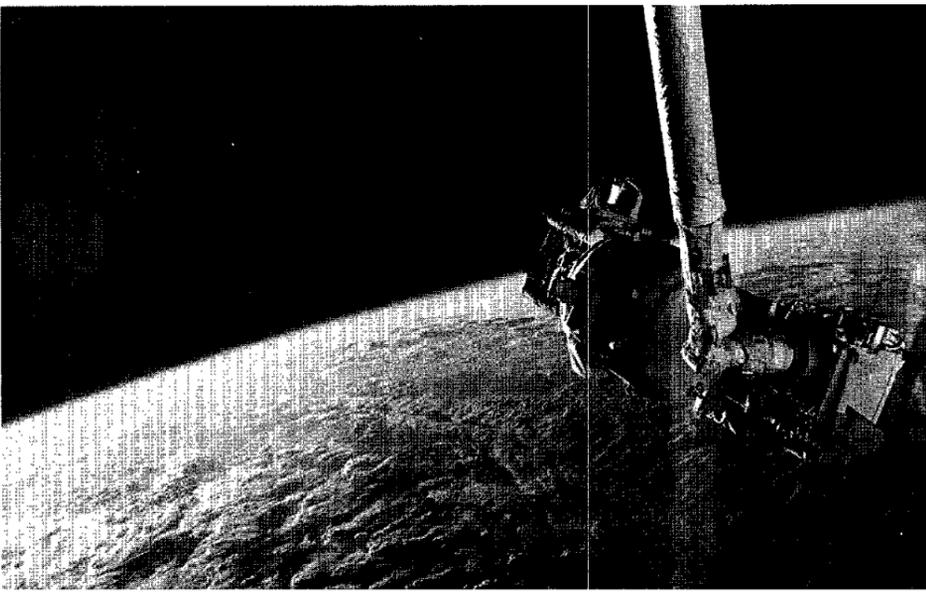
AKC Basset hound, female, tri-color, 1.5 yrs, shots, \$225; Himalayan, male, choc point, neutered, declawed, shots, 4.5 yrs, \$50. Donna, 337-3838.

AKC reg yellow Lab puppies, \$250. Mary Anne, x34413 or Rob, 280-8125.

Free, baby golden hamsters, limit two. x35813.

Free, cat, 1yr, tortoise shell, spayed, shots. 333-0982.

Rottweiler puppies, AKC reg, shots. Bob, 488-2269.



Dynamic Duo: *Discovery* and crew outstanding

Discovery and its seven member crew earlier this month successfully completed one of NASA's most complicated missions. Both the orbiter and its crew faced a challenging mission on STS-39.

After eight days, seven hours and 22 minutes *Discovery* landed at Kennedy Space Center May 6 after managers decided against landing at Edwards Air Force Base in California because of strong crosswinds.

Clockwise from above left: The Strategic Defense Initiative Organization Shuttle Pallet Satellite is shown on the end of the remote manipulator system end effector. The SPAS collected data while free flying and while attached to the RMS.

The Aurora Australis, also known as the Southern Lights, is depicted in this photograph. One of the mission's

objectives was to measure auroral emissions' spectral and spatial characteristics.

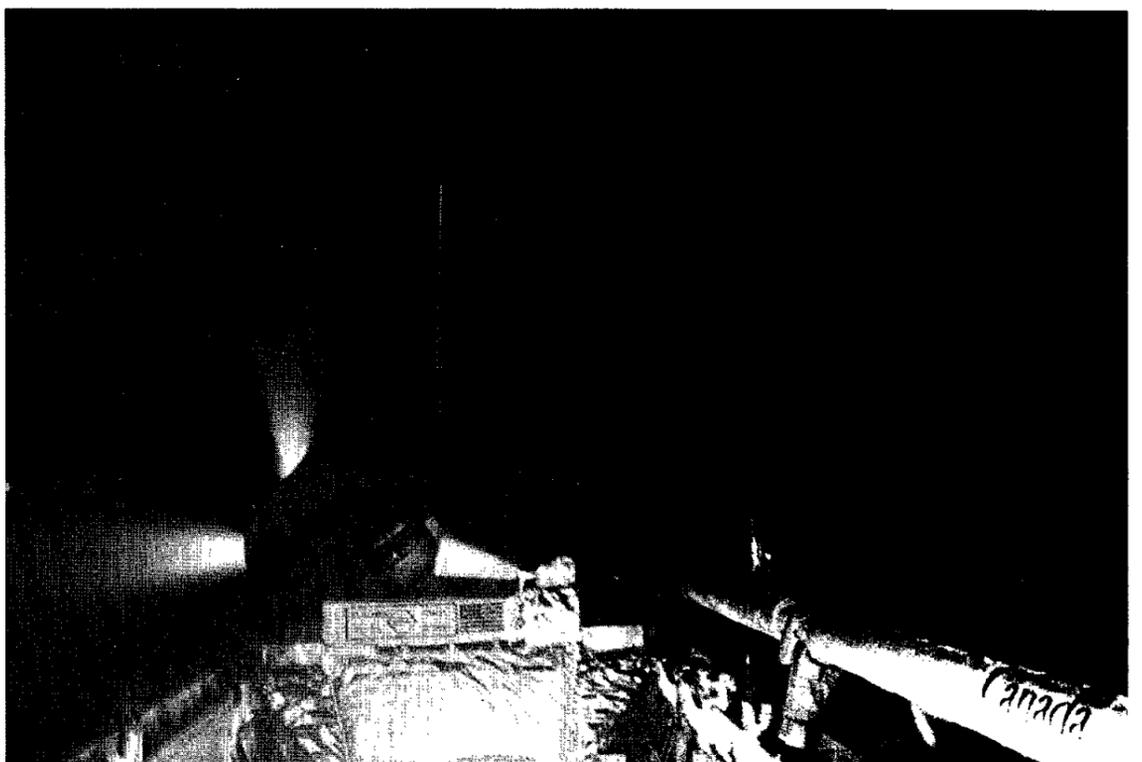
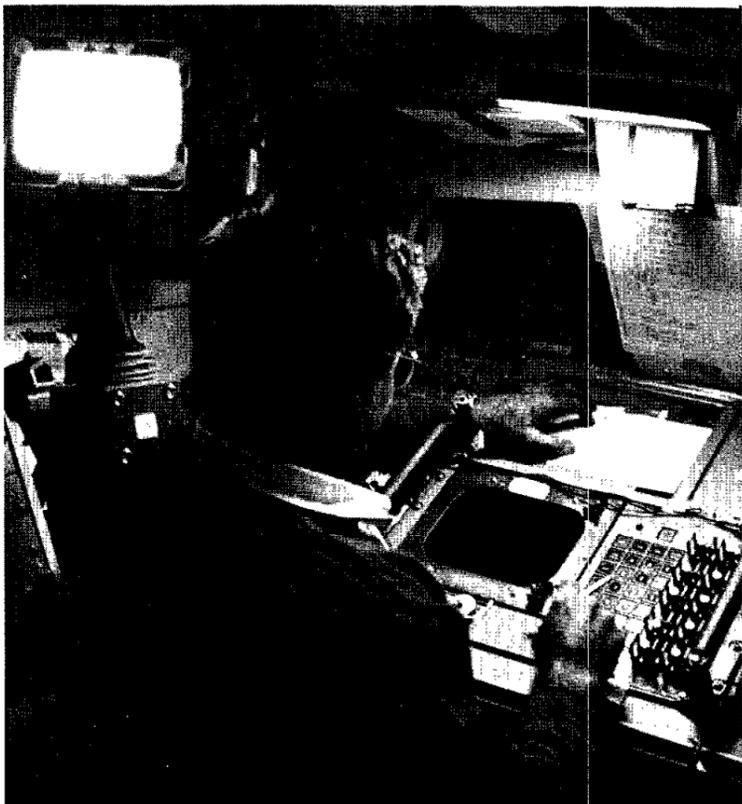
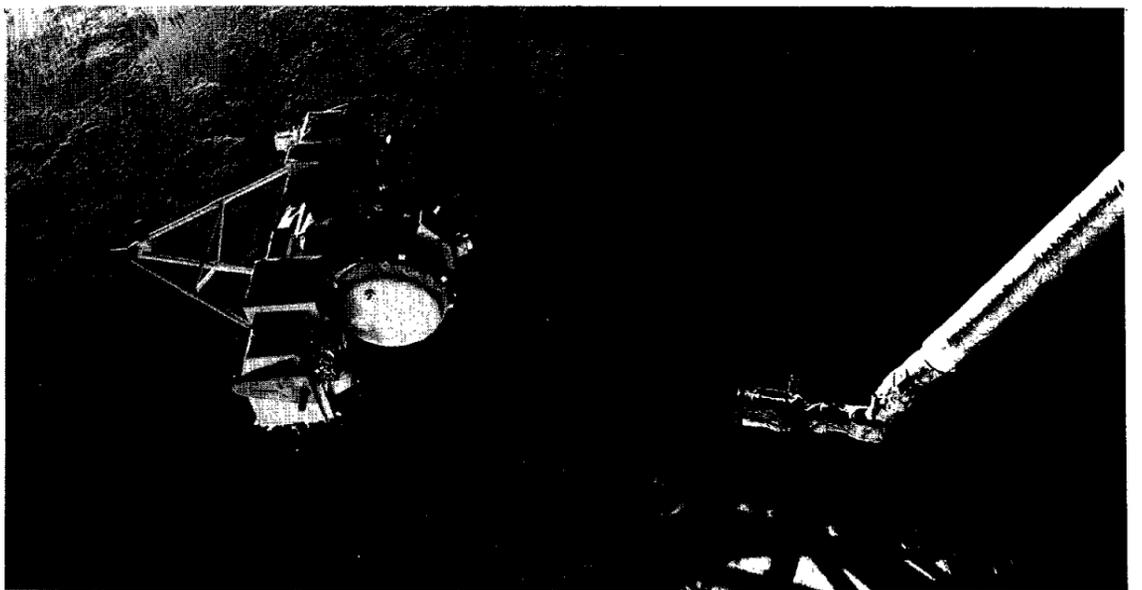
The SDIO's SPAS-II is released by *Discovery's* RMS to collect data. One of the crew members photographed this scene from inside *Discovery's* crew cabin.

Discovery fires reaction control sub-system thrusters in this scene taken from inside the crew cabin.

Astronaut Charles (Lacy) Veach monitors experiment data on the aft flight deck of the Earth-orbiting *Discovery*.

STS-39 Commander Michael Coats is shown in the orbiter's aft flight deck as SPAS-II hovers on the end of the RMS and is visible out the orbiter's overhead window.

The STS-39 seven member astronaut crew poses on *Discovery's* mid-deck for an inflight crew portrait.



Astrophysics mission to refly aboard space shuttle

Based on last year's successful Astro mission, NASA has announced that a second Astro mission will fly aboard a space shuttle.

"We are delighted to be able to refly this proven scientific performer," said Dr. Lennard A. Fisk, associate administrator for space science and applications.

The success of the earlier mission and the instruments' demonstrated ability to acquire high-quality scientific data are among the major reasons for reflighting the Astro payload.

Astro-2, like Astro-1 which flew in December of 1990 aboard the Space

Shuttle *Columbia*, will be dedicated to astrophysics. The three instruments that will fly on Astro-2 and observe energetic objects in space in the ultraviolet portion of the electromagnetic spectrum are:

- The Hopkins Ultraviolet Telescope, developed at Johns Hopkins University, which performs spectroscopy by breaking light into its constituent colors, allowing scientists to analyze the chemical composition and temperature of the objects it observes;

- The Ultraviolet Imaging Telescope, developed by NASA's God-

dard Space Flight Center, which produces images of especially hot components of nebulae, stars and galaxies which help explain the physical structure of such objects; and

- The Wisconsin Ultraviolet Photopolarimeter Experiment, developed at the University of Wisconsin, which measures light's polarization. These probe the orientation and detailed physics of the distant regions in which the light originates.

Astro-2 complements the much larger Hubble Space Telescope. HUT, for example, explores a region of the spectrum immediately adja-

cent to that studied by Hubble. UIT, because of its very large field of view, can serve as a "finder" for the powerful imaging devices aboard Hubble. Finally, WUPPE's precision polarimetry adds another dimension to the physical understanding of astronomical objects obtained from Hubble's collection of instruments.

During the Astro-1 mission, new results were obtained at wavelengths observable only from space. Astronomers gained insights into the properties of diffuse dust found between stars as well as details of the formation of new stars in distant galaxies.

They also learned that the predicted decay of certain sub-atomic interstellar particles did not occur, at least not at the expected level.

"The Astro principal investigators and their teams will be very pleased," said Dr. David Huene-moerder, Astro-1 program scientist. "That first flight was just a taste of the scientific insights they expect to emerge from Astro-2."

Marshall Space Flight Center will manage the Astro-2 mission for the Office of Space Science and Applications, NASA Headquarters in Washington, D.C.

SR&QA seeks nominees for quality prize

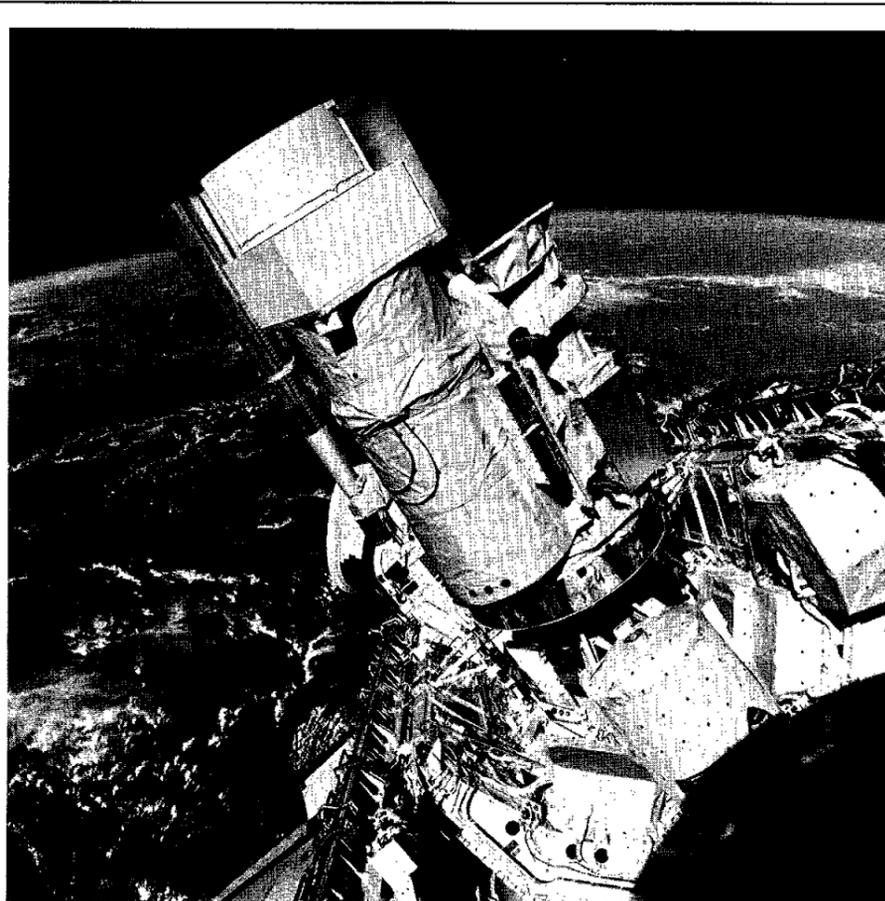
Nominations are being accepted for the Quality Partnership Award, presented twice a year by JSC's Safety, Reliability and Quality Assurance Office.

The award recognizes people outside SR&QA who play key roles in helping JSC employees and support contractors reach a common goal of excellence. The first JSC Quality Partnership Award was given in October 1988. It began as a quarterly award, but after review managers decided it would be more effective as a semiannual award. It was designed to recognize professionals who do not work in the quality field but who make significant contributions to quality.

The most recent recipient was James Lecher, a senior staff engineer for Lockheed Engineering and Sciences Co., for his achievements as the leader of the Inertial Measurement Unit Support Team.

Nominations by peers or managers should be submitted to the Quality Assurance and Engineering Division, Code ND. Deadline is June 30.

Nominees may not work in the quality field or make direct contributions to the SR&QA Office at JSC. For more information, call M.C. Perry, chief of the Quality Assurance and Engineering Division, at x34352.



Columbia's flight of almost nine days duration, from Dec. 2-10, 1990, carried the Astro-1 payload and was dedicated to astrophysics. The various components of the Astro-1 payload are seen backdropped against the Earth in this scene photographed through Columbia's aft flight deck windows.

Sons, daughters of JSC employees earn scholarships

The son of a JSC employee is one of three recipients of the 1991 NASA College Scholarships, and the children of three other JSC employees are winners of 1991 NASA Exchange-JSC Scholarships.

Christopher T. Bauch, son of Garland T. Bauch of the Space Shuttle Program's Management Integration Office, has been awarded one of the 1991 NASA College Scholarships. He plans to use his scholarship to study physics and astronomy at the University of Texas this fall. Garland Bauch said his son hopes to one day become either a NASA research scientist or a university professor.

Bauch will graduate from Clear Creek High School in League City Sunday. He ranked second in a class of 476 seniors with a 4.48 grade point average that was possible because of his enrollment in honors courses. He is his class' salutatorian.

The NASA College Scholarship Fund Inc., established in 1982, was endowed by Pulitzer Prize-winning author James A. Michener. Other 1991 scholarship winners are Andy Chien-hung Lin, son of Kennedy Space Center's Dr. Feng-nan Lin; and Julie M. Makinen, daughter of Lewis Research Center's Michael D. Makinen.

The NASA Exchange-JSC Scholarship program also has announced its 1991 winners. The scholarship, separate from the NASA College Scholarship, began in 1967 and provides up to \$1,000 a year for four years for the dependents of JSC employees.

This year's winners are: Rebecca Renee Boyce, daughter of Rex Allen Boyce of Flight Operations' T-38 Aircraft Section, who plans to enter the University of Texas as a premed major. A June graduate of Friendswood High School, she ranked fifth in her class.

Julie Ann Hall, daughter of Robert F. Hall of Human Resources' Programs and Policy Office and a June graduate of Round Rock High School, who will attend Texas A&M University as a premed major.

Stephen R. Martin, son of Robert L. Martin of Center Operations' Program Transportation Section, who will study computer science at Georgia Southern University. A June graduate of Friendswood High School, he ranked 10th in his graduating class.

And Vinod Valloppillil, son of Vincent A. Valloppillil of Safety, Reliability and Quality Assurance's Payload Reliability Engineering Branch, who will study computer engineering and business administration at the University of Pennsylvania. He is a graduate of Clear Creek High School.

Clinic offers blood pressure screening

The JSC Clinic will offer total blood cholesterol counts and blood pressure screenings the week of June 3-7 at various locations around the center.

Since 1972, stroke mortality rates have declined by more than 50 percent, according to the National Heart, Lung and Blood Institute. One reason for the decline is the increased awareness, treatment and control of blood pressure through workplace-

sponsored programs.

JSC's next screening will take place in 18 buildings over a week-long period starting June 3. The cholesterol count will be a simple finger-stick test. Fasting is not necessary. The schedule is:

June 3: Bldg. 1, 8:30 a.m.-noon; Bldg. 7A, 1-2 p.m.; and Bldg. 15, 2:30-3:30 p.m.

June 4: Bldg. 30, 8:30 a.m.-noon; Bldg. 16, 12:30-2:30 p.m.; and Bldg. 100, 2:45-

3:15 p.m.

June 5: Bldg. 32, 8-9 a.m.; Bldg. 37, 9:30-10:30 a.m.; Bldg. 31, 10:30-11:30 a.m.; Bldg. 44, 1-2 p.m.; and Bldg. 14, 2:30-3:30 p.m.

June 6: Bldg. 419, 8:30-10 a.m.; Bldg. 273, 10:30-11:30 a.m.; Bldg. 227, 12:30-1:30 p.m.; and Bldg. 325, 2-4 p.m.

June 7: Bldg. 45, 8:30-11:30 a.m.; Bldg. 9, 12:30-1:30 p.m.; and Vanguard Bldg., 2-3 p.m.

Hard work fixes Columbia's problems

(Continued from Page 1)

X-rays of the sensors from *Columbia*, *Atlantis* and *Discovery* focused the problem on a single model of hydrogen sensor. However the five cracked sensors found in the shuttles were in no danger of coming apart, managers said. Cracks were found only in the welds on the tip of the sensors. The stainless steel internal component and welds at the ends of the sensors that also serve to bond the instrument together were intact in all cases, except for the unit

on which the original failure analysis was performed.

The nine sensors have been a part of shuttles since the beginning of the program, and engineers determined they had gathered enough historical information on the behaviour of the fuel system that the three hydrogen sensors removed from the system were no longer required. The three plugs will be installed on all shuttles for the time being.

Elsewhere at Kennedy Space Center, preparations of *Atlantis*, in

Bay 2 of the processing hangar, for a late July launch are on schedule. This week, routine tests were performed on the fuel tank doors, main engine plumbing, brakes and nose-wheel steering. The forward reaction control system steering jets were to be installed late in the week.

In Bay 1 of the hangar, *Discovery*'s main engines are being removed following its recent return from STS-39, and work is underway on the spacecraft's thermal protection system tiles.

Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

Editor Kelly Humphries

Associate Editors Pam Alloway
Kari Fluegel

Mission Control viewing hours

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of STS-40.

Based on a 7 a.m. CDT Saturday launch, employees will be allowed to visit from 11:30 a.m.-2 p.m. and 5-7 p.m. June 5, 11:30 a.m.-2 p.m. June 6, 11:30 a.m.-2 p.m. and 5-7 p.m. June 7, and 1-5 p.m. June 8 and 9.

Employees must wear their badges and escort family members through the public entrance on the northeast side of Bldg. 30. Viewing times may change with little notice; call the Employee Information Service at x36765 for the latest information.

JSC to air seminar

JSC employees will have an opportunity to participate Wednesday in an American Chemical Society seminar on "Complying with the OSHA Lab Standard."

The two-hour broadcast will be on JSC Television Distribution System Channel 9 at noon. The broadcast will be monitored in the Bldg. 45, Rm. 304 conference room, and the Safety Learning Center in Bldg. 226N.

For more information, call Beth Hall at x33078.

NASA-JSC

JSC new visitors center construction underway, scheduled to open doors to public fall of 1992

(Continued from Page 1)

Although the new visitors center was on center stage during Tuesday's ceremony, another facility still on the drawing board and under debate never strayed too far from the speakers' minds as members of Texas' congressional delegation pledged their support for the endangered space station.

"The visitors center, like the space station itself, has the potential to educate and enlighten children for generations to come," said Congressman

Mike Andrews (D-Houston). "Our challenge, in the weeks and months and years ahead, yours and mine, is to make sure all Americans can share in the dreams and promises of our country's space program, insuring it does remain one of the great adventures of our time."

Other speakers included Houston Mayor Kathy Whitmire, Harris County Judge Jon Lindsay, U.S. Senators Lloyd Bentsen and Phil Gramm, and Congressman Jack Brooks.

Harold Stall, president of the Man-

ned Space Flight Education Foundation Inc., developers of the new visitors center, and William Kelly, chairman of the foundation's board of directors, introduced the speakers. An additional presentation was made by Coleman Moore, president of the Clear Lake Area Chamber of Commerce.

Following the remarks, the dignitaries donned white hard hats, grabbed Apollo-era lunar shovels and ceremoniously dug into a pile of white sand for the ground breaking.

The program concluded with fireworks and several parachutists who dropped from the sky outfitted in patriotic colors and carrying American and Texas flags.

Tax-exempt bonds are largely financing Space Center Houston. The communities of Webster, Nassau Bay and League City have agreed to raise their hotel-motel occupancy taxes by 1 percent to support the center. The federal government also had pledged \$10 million for the project.